

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : **Confirmation No. 4361**
Kenji SAITO et al. : Attorney Docket No. 2005_0635A
Serial No. 10/532,586 : Group Art Unit 3723
Filed June 17, 2005 : Examiner Robert J. Scruggs

SURFACE-TREATING PROCESS FOR
VACUUM MEMBER : **Mail Stop: AF**

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**THE COMMISSIONER IS AUTHORIZED
TO CHARGE ANY DEFICIENCY IN THE
FEES FOR THIS PAPER TO DEPOSIT
ACCOUNT NO. 23-0975**

Sir:

Applicants respectfully request review of the Examiner's rejections, as set forth in the Office Action of December 10, 2008, for the reasons set forth in detail below. This request is submitted concurrently with a Notice of Appeal, and the required fee.

Applicants note that during a telephone conversation with the Examiner on March 31, 2009, the Examiner suggested that a Pre-Appeal Brief Request for Review be filed, so that the Examiner, his Supervisor, and another Examiner could consider the outstanding issues. Applicants appreciate the Examiner's helpful suggestion.

The rejection of claims 1, 3-11 and 17-19 under 35 U.S.C. § 103(a) as being unpatentable over Higuchi et al., in view of Noguchi et al., Yoneda and Miller; as well as the rejection of claim 19 under 35 U.S.C. § 103(a) as being unpatentable over Higuchi et al. in view of Noguchi et al., Yoneda, Miller and Tsuchiya et al. are respectfully traversed. Please see the last paragraph of page 5 thru the second full paragraph of page 6 of Applicants' Amendment filed August 19, 2008 for a discussion of the Examiner's position.

The Examiner admits the neither Higuchi nor Noguchi describe the liquid medium used in Applicants' claimed process, i.e., a liquid medium including no hydrogen atom, wherein the liquid medium is a saturated hydrocarbon in a molecule of which the hydrogen atom(s) are all substituted with fluorine atom(s). The Examiner relies on Yoneda as teaching the combination of a non-aqueous solution intermingled with a polishing medium, wherein the non-aqueous

medium is formed from various types of fluorocarbons. However, the Yoneda reference does not teach a compound wherein **all** of the hydrogen atoms have been replaced with fluorine atoms. In fact, Yoneda teaches such compounds as hydrofluoroether and hydrofluorocarbon, which clearly include hydrogen substituents. The Examiner appears to acknowledge this, as the Miller reference is relied upon to demonstrate that fluorocarbons exist, wherein all of the substituents are fluorine atoms. However, the Examiner has not explained why one would look from the teachings of Higuchi and Noguchi to the teachings of Yoneda or Miller.

Yoneda describes a manufacturing method of a ceramic electronic part, comprising the step of polishing a ceramic chip. (Please see paragraph [0006], lines 1-6 of Yoneda.) However, Applicants' independent claims require polishing a vacuum member made of one kind or two or more kinds selected from the group consisting of niobium, titanium, stainless steel, copper, aluminum and iron.

Furthermore, Miller merely teaches that there exists a saturated or unsaturated fluorocarbon compound in which all of the substituents are fluorine atoms. However, this fact alone does not justify combining Miller with the primary references. Additionally, Miller discloses in column 2, lines 22-28 that "Another object of this invention is to devise a convenient and effective synthesis ..., the perfluorocarbons and perfluorochlorocarbons especially after further treatment to saturate the unsaturated bonds present with fluorine or chlorine, being useful as lubricants where reactive substances are present." (Emphasis added.) One of ordinary skill in the art would understand that lubricants prevent or decrease friction. On the contrary, the mechanically polishing step recited in Applicants' claims needs or makes use of friction. Thus, the Miller reference teaches away from Applicants' claimed method, and certainly cannot be relied upon as motivation to use the compound of Miller as a liquid medium in mechanical polishing.

In view of the above, Applicants respectfully assert that absent the use of Applicants' own disclosure, one skilled in the art would not have combined the references in the manner suggested by the Examiner. As stated by the Supreme Court in KSR International Co. v. Teleflex Inc., "the factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning." (See KSR International Co. v. Teleflex Inc., 237 S. Ct. 1727 (U.S. 2007), referring to *Graham v. John Deere Co. of Kansas City*, 86 S. Ct. 684, which warned against a "temptation to read into the prior art the

teachings of the invention in issue” and instructing courts to “guard against slipping into the use of hindsight”. For this reason alone, Applicants respectfully assert that the Examiner’s combination of references is unfounded, and the rejection should be withdrawn.

Additionally, Applicants’ invention exhibits unexpected and surprising effects compared to Higuchi, which is the closest prior art. Specifically, in Test Example 1 (on pages 28-30 of the present specification), the effect of various liquid media on occlusion of hydrogen as a solid solution into a plate-shaped niobium in mechanical polishing (centrifugal barrel polishing disclosed in Higuchi et al.) was investigated. When a vacuum member is mechanically polished with water and a surfactant as a polish assistant, as disclosed in Higuchi et al., hydrogen is occluded as a solid solution into the vacuum member (hydrogen concentration is 79.1 ± 5.0 ppm). On the other hand, occlusion of hydrogen as a solid solution into the vacuum member is dramatically suppressed by mechanically polishing the niobium sample with a liquid medium including a saturated hydrocarbon in a molecule of which a hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms, such as Fluorinert FC77, as in the presently claimed invention (hydrogen concentration is 4.6 ± 0.8 ppm). [Applicants direct the Examiners’ attention to Test Examples 1 and 2 and Example 1 of Applicants’ specification, as well as the Rule 1.132 Declaration, which were previously submitted on September 24, 2007. In Experiment 3 of this previously submitted Declaration, the Comparative Experiment using water as a liquid medium corresponds to the invention of Higuchi, which is the closest prior art.]

Thus, Applicants’ invention unexpectedly suppresses the occlusion of hydrogen as a solid solution into an inner surface of the vacuum member, not only during mechanical polishing, but also during electrolytic polishing following the mechanical polishing. Due to the suppression of hydrogen occlusion, a superconducting accelerating cavity having a high performance can be made successfully, thus rendering unnecessary vacuum annealing after the polishing. The unexpected and surprising effects of Applicants’ invention are achieved by adopting a liquid medium including a saturated hydrocarbon in a molecule of which a hydrogen atom or hydrogen atoms are all substituted with a fluorine atom or fluorine atoms when the vacuum member is formed and polished. These results would not have been expected by those of ordinary skill in the art at the time of Applicants’ invention.

Applicants have repeatedly presented arguments that the claimed invention results in superior and unexpected results when compared to the closest prior art. As the Examiners are

certainly aware, a showing of unexpected and superior results is sufficient evidence of non-obviousness. (Please see MPEP 716.02(a)). Thus, it is asserted that Applicants' showing of superior results overcomes any asserted case of obviousness. The superior effect of Applicants' claimed invention is neither disclosed nor suggested in Higuchi et al., Noguchi et al., Yoneda, Miller, nor the combination thereof.

In response to these arguments, the Examiner merely states that while Applicants provide a statement of unexpected results, the combination of references would also create this effect. In the Advisory Action, the Examiner states that the combination in the rejection can be made with a different motivation than described by Applicants, and therefore would have the same results as disclosed by Applicants.

However, Applicants respectfully assert that the Examiner's position is untenable, as this reasoning would nullify any showing of unexpected results in any situation involving a combination of references, where the unexpected results are shown by a comparison with the prior art. Specifically, the Examiner appears to take the position that since the asserted combination of references teaches the limitations of Applicants' claimed method, then the combination of references would achieve Applicants' unexpected results. However, this position is based on an inappropriate comparison of Applicants' invention to itself, i.e., the combination of references.

As clearly explained in the MPEP, when demonstrating unexpected results, the appropriate comparison is that of Applicants' invention with the closest prior art, i.e. a single reference. MPEP 716.02(e) states, "An affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a *prima facie* case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979)." (Emphasis added.)

Further, section III of this portion of the MPEP states, "Although evidence of unexpected results must compare the claimed invention with the closest prior art, applicant is not required to compare the claimed invention with subject matter that does not exist in the prior art. *In re Geiger*, 815 F.2d 686, 689, 2 USPQ2d 1276, 1279 (Fed. Cir. 1987) . . . ; *In re Chapman*, 357 F.2d 418, 148 USPQ 711 (CCPA 1966) (Requiring applicant to compare claimed invention with polymer suggested by the combination of references relied upon in the rejection of the claimed invention under 35 U.S.C. 103 'would be requiring comparison of the results of the invention

with the results of the invention.' 357 F.2d at 422, 148 USPQ at 714.).” Thus, the Examiner is respectfully requested to consider Applicants’ showing of unexpected results, as compared to the teachings of the closest prior art, i.e., Higuchi.

Contrary to the Examiner’s position, the question to consider is not whether the combination of references could or would achieve the (unexpected) results of Applicants’ invention. Rather, the question is whether Applicants’ invention has unexpected results when compared to the closest prior art.

In this case, the Examiner has dismissed Applicants’ showings of unexpected results. Additionally, the Examiner’s rebuttal argument is based on the idea that Applicants’ invention must be compared to itself. Furthermore, the Examiner has failed to assert, or provided any evidence, that the cited combinations of references would be expected to achieve the results discovered by Applicants’, i.e., preventing the occlusion of hydrogen as a solid solution into a vacuum member during mechanical polishing, chemical polishing or electrochemical polishing.

Accordingly, for the reasons set forth above, as well as those in the previously submitted remarks, the unexpected and superior effect of Applicants’ invention is neither taught nor suggested in Higuchi, Noguchi, Yoneda, Miller and Tsuchiya, nor the cited combinations thereof. Thus, for this reason alone, the above-rejections are untenable and should be withdrawn.

For the foregoing reasons, Applicants respectfully assert that the subject matter recited in the pending claims is unobvious over the cited combinations of references, and the rejection should accordingly be withdrawn. Allowance of the claims is respectfully solicited.

Respectfully submitted,

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